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# RTD TODAY

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Resources and Technology Division  
Economic Research Service  
U.S. Department of Agriculture, Washington, DC

A newsletter for employees  
and colleagues of RTD

**THIRD QUARTER  
1993**

## FROM THE DIRECTOR'S OFFICE

During the recent 1994 workplan cycle, management and staff identified research and data activities that will define the Division's program for the upcoming year.

Major research activities for FY 1994 include:

- Evaluating the benefits and costs of farm and environmental policies that affect the quality of agricultural resources and the environment, with an emphasis on productivity, sustainability, biodiversity, technology, and accounting for all agricultural outputs.
- Examining the economic determinants of chemical use in agricultural production, and determining how agricultural chemical policies influence the welfare of consumers and producers; evaluating the economic effects of alternative policies to reduce environmental and health risks, including the role of non-chemical substitutes for pest control.
- Analyzing the policy trade-offs between agricultural output, natural and environmental resources, and the economy as influenced by commodity and conservation programs, Western water policies, protection of wetlands and flood-prone areas, Endangered Species Act, and ground and surface water quality provisions.
- Investigating the consequences for U.S. agriculture and U.S. agricultural resources of changes in the global environment, climate, technology, and demographic trends; developing environmental links relevant to global food production such as deforestation, soil quality, water availability, and species diversity; assessing the impact of freer trade on environmental quality and the impact of environmental policy on trade flows.

Providing critical support to these major research activities are database development activities in the areas of chemical use and more sustainable practices; the relationship between pest control practices and residues; water quality, agricultural practices, and technological alternatives; and value and use of agricultural and environmental resources, including farmland.

In addition to publishing our research in various USDA publications and other outlets, we have identified six priority reports, which we refer to as commissioned reports. These reports are intended to reach a broad, non-technical audience and provide a comprehensive overview and economic analysis of current and emerging resource issues related to agricultural activities. The reports are:

***Incentives for Stewardship in U.S. Agriculture*** - In the next farm bill, policymakers will continue to address how to meet (and maintain) conservation and environmental goals in U.S. agriculture while keeping the sector economically healthy. One possible policy avenue is the use of stewardship payments, which provide farmers financial incentives in exchange for resource and environmental performance. This report examines how stewardship programs might work, the effects on production and environmental quality, and the effects on income distribution within the sector.

***Reducing Pesticides in the Food Supply*** - In June, 1993, the Clinton Administration announced a commitment to reduce the use of pesticides in the food supply. The RTD report will examine how health risks from dietary chemical exposure can be reduced in the nation's food supply. The report will draw on data developed within the USDA's Pesticide Data Program to summarize what is known about chemical use, residues and exposure. The report will examine the economic determinants of use and exposure and the economic effects of policy alternatives to reduce risk.

***Accounting for Environmental Assets in Agriculture*** - This report is motivated by the need to adjust agricultural productivity and net domestic product (income) by changes in the quantity and quality of resource stocks and flows. The report will discuss and critique environmental accounting methodology and review recent efforts to value agricultural resources. In addition, the study will use current techniques to estimate resource-adjusted net domestic product.

***Water in the American West: Reclamation Policy Reform in California's Central Valley Project*** - Enactment of the 1992 Central Valley Project Improvement Act (CVPIA) marks the beginning of a new period of water management in the American West. The report will: 1) provide an overview of CVPIA and highlight policy reforms provided for in the Act; 2) provide a quantitative analysis of the CVPIA in terms of policy efficiency, agricultural impacts, and implementation issues; 3) provide a qualitative analysis of the relative strengths and weaknesses of the CVPIA as a model for westwide water reform.

***Managing Public Interest in Public and Private Land*** - The identification and establishment of public interest in land use decisions has become a major policy component of federal, state, and local efforts to balance resource use and conservation on both public and private land. These efforts increasingly rely on the purchase of development rights by state and local governments and by private land trusts. This report will examine various approaches to managing public land and analyze the economic trade-offs associated with alternative approaches.

***Biodiversity Conservation and Sustainable Agricultural Development: An Integrated Framework for Policy Analysis*** - Recently, concerns have been raised about the need to preserve genetic resources and key habitat areas to protect and maintain biodiversity. The report will present an analytical framework for measuring current economic incentives for biodiversity conservation, including policies that affect marginal benefits of habitat destruction and marginal benefits of habitat conservation.



JOHN A. MIRANOWSKI



## PROGRAM HIGHLIGHTS

### Environmental Valuation Update

The RTD mission includes economic analysis of the impacts of agricultural production on natural resources and the environment. We also assess the economic consequences of agricultural and environmental policies affecting natural resources supply, use and quality,

One component of this effort is our on-going program in environmental valuation. A comprehensive assessment of the full social costs and benefits of food and fiber production requires that we understand, measure, and evaluate the economic value of changes in environmental quality which may be related to production choices made by farmers and ranchers. This effort is complicated by the fact that, in most instances, the value of environmental quality changes cannot be measured by market prices. Instead, we must use non-market techniques for valuing changes in resource quality, which yield measures of the value consumers place on environmental quality based on the choices they make in using resources such as water, wildlife, and wilderness.

These measures of the value of environmental quality changes are important for two reasons. First, they provide a more complete picture of the contribution of the agricultural sector to the Nation's economy by accounting for off-farm social costs. In addition, they bring an extra dimension to our task of policy analysis by allowing us to account for all the costs and benefits which may accrue to specific policy choices, including agricultural and environmental policy legislation.

Previous efforts by RTD economists have yielded some first-level assessments of the off-farm costs of changes in water quality from agricultural pollution sources. Research published in the late 1980's estimated the overall damages to recreational, commercial, and industrial users of the Nation's surface water systems from sedimentation due to cropland runoff, and the possible costs of testing for agricultural ground water contamination and providing safe drinking water supplies. More recent efforts have examined the benefits and costs of changes in air quality from expanded use of ethanol-blended motor vehicle fuels, and the benefits associated with protection and restoration of endangered species and wildlife habitat threatened by agricultural resource use.

RTD has also begun a program to integrate economic measures of environmental quality changes with traditional measures of economic activity. "Green" GNP and NNP measures reflect the environmental damages associated with the production of commodities as well as the depletion of the natural resource base; just as the physical depreciation of plant and equipment is currently subtracted from GNP to arrive at NNP, so too can depletion of the natural resource base be used to adjust GNP for environmental costs.

New work in environmental valuation is being planned to support RTD's increased emphasis on policy analysis. We will be working with other agencies participating in the National Survey on Recreation and the Environment and applying non-market valuation models to primary survey data to estimate the benefits of protecting or improving rural water quality. Benefits transfer and contingent valuation research is being undertaken to develop better estimates of the benefits of protecting drinking water supplies from agricultural chemicals. Environmental valuation research is also being tied in with on-going efforts to evaluate the impacts on farm management, farm income, and water quality of various environmental and agricultural policies, including the Clean Water Act reauthorization, Endangered Species Act implementation, the Farm Bill, and USDA's water quality program. Accounting for the value of environmental changes in this way broadens the scope and breadth of our economic analyses.

## Resource and Commodity Policy Update

Future policies affecting U.S. agriculture likely will be influenced by increased public demands for greater environmental accountability in the agricultural sector and a continued trend toward reduced levels of agricultural spending by government. These forces will converge in the next omnibus Farm Bill, expected in 1995. Several economic analyses underway within RTD are designed to provide improved information to the Administration, the Congress, and the public on issues relevant to the development of the 1995 Farm Bill conservation and commodity program provisions.

Conservation Reserve Program Analysis--While a number of agricultural conservation and environmental issues will be debated in the next two years, one that is sure to be considered is the expiration of Conservation Reserve Program (CRP) contracts. About 36.5 million acres of highly erodible or environmentally sensitive cropland have been enrolled in the CRP under 10-year contracts. The first 2 million acres of contracts expire in October 1995. In addition to in-house economic analyses of CRP policy options, RTD researchers are active participants on a Great Plains Agricultural Council (GPAC) task force, and an interagency USDA work group, both investigating the future of CRP lands.

The first of these analyses is an examination of how farmer, land, and enterprise characteristics are likely to affect post-contract Conservation Reserve Program (CRP) land use decisions. The results of this study provide insights into the potential effectiveness of alternative post-contract CRP policy options. For example, government cost-sharing of infrastructure (fencing and watering facilities) for livestock production was found to be insignificant in encouraging the post-contract use of CRP acres for livestock production in favor of a return to crop production.

Future economic conditions could greatly affect post-contract CRP land use. Other RTD research focuses on how different future commodity demand situations could affect post-contract uses of CRP land if CRP contracts are not renewed. Post-CRP cropland use was simulated to derive a comparative static analysis for the U.S. crop sector. Results of this study indicate that under projected demand conditions for wheat and feed grains, returning 1/3 and 1/2 of CRP acres to crop production would likely require that annual commodity program set-aside be increased. Although increases in soil erosion would be moderated by the conservation compliance provision of the 1985 Farm Bill, wildlife habitat and water quality protection currently provided by the CRP would be greatly diminished.

Other completed research takes a look at selected policy options for influencing post-contract CRP land use. Contract extension and easement options of 5 million acres and up were examined using alternative acreage selection criteria. Results of this work suggest that most CRP benefits, could be maintained by continued protection of a limited amount of land. For example, 75 percent of the surface water quality benefits provided by the CRP could be maintained with a contract extension or easement program of only 10 million acres. Results of this and the previous study are summarized in two recent articles; one in the Journal of Soil and Water Conservation, and the other in Choices.

Finally, RTD researchers will analyze data from a 1993 survey of CRP participants being conducted by the Soil and Water Conservation Society in preparation for a national conference on the future of the CRP, which will be held in Washington, DC, next February. This national level 5 percent survey is seeking information on how producers plan to use their CRP acres after contracts expire, and how they might react to possible options for keeping some or all of their CRP acres in a permanent soil-conserving cover of grass or trees.

Conservation at the Crossroads--In FY-93 USDA expenditures on conservation programs totaled approximately \$3.4 billion. Of this, more than half was for CRP rental payments, approximately one-fourth was for education and technical assistance, and one-tenth was for cost-sharing. But agricultural conservation policy now seems poised at a crossroads. Indefinite continuation of current programs in the



next Farm Bill seems unlikely; at almost \$2 billion per year, the CRP appears costly in the current budgetary environment, and with even greater reductions in Federal agricultural price and income support likely, leverage of the compliance provisions will be declining. As a result, a RTD study begun in FY-93 and now nearing completion, takes a comprehensive look at agricultural conservation policy tools including land retirement, cost-sharing, education-technical assistance, and compliance, and the roles they might play in future policy. Several policy regimes are being considered under the assumption of significantly decreased funding. These include options that continue the reliance on land retirement, although better targeted to water quality considerations, options that would depend more heavily on cost-sharing approaches, such as the Water Quality Incentive Program, and options that employ a mix of approaches.

Incentives for Stewardship in Agriculture--At a recent national conference on U.S. conservation policy, "green payment" or "environmental stewardship payment" approaches were endorsed by more speakers than any other approach as an option for the future of agricultural conservation. This concept involves reorienting some or all of the payments currently made under the commodity programs to environmental performance. In other words, paying farmers on the basis of how they farm, not necessarily what they grow.

In July RTD hosted a roundtable to discuss how a environmental stewardship payment system might be implemented and how future environmental and economic goals in agriculture could be met. Prior to the roundtable, RTD researchers prepared a background paper to facilitate the discussion. Invited discussants included Ken Cook (Environmental Working Group); Bruce Gardner (University of Maryland); Tom Hebert (Senate Committee on Agriculture); Allen Rosenfeld (Public Voice for Food and Health Policy); and Jeffrey Zinn (Congressional Research Service).

Building on the roundtable and discussion paper, for FY-94 RTD researchers are initiating a study designed to broadly examine the concept of stewardship in agriculture. The study will evaluate the environmental costs and benefits of current U.S. commodity and conservation programs, and analyze the economic and environmental implications of moving toward stewardship programs designed to give farmers both income support and incentives to increase the supply of environmental services.

## **EVENTS AND ACTIVITIES**

### **Departmental Awards**

RTD staff were on three teams receiving Departmental Awards at the first USDA Celebration of Excellence held on the mall September 23, 1993. The Distinguished Service Award, the Department's highest award, was received by the Departmental Biofuel's Workgroup "for innovative interagency coordination to develop and implement the Secretary's initiative to enhance USDA's biofuels activities". RTD Director John Miranowski was the ERS Group Member.

The Department's second highest award, the Superior Service award, was received by two ERS teams with RTD members. The ERS Policy Analysis Coordination Team was recognized "for significant contributions to U.S. agricultural policy through development of timely, accurate, clear and concise information and analysis for policymakers." Betsey Kuhn was the RTD member of this team.

The Eastern European Program Development Team was recognized "for outstanding success in assisting Eastern European governments in creating agricultural information and analysis programs to support their newly developing market systems." Stan Daberkow and Gene Wunderlich were RTD team members.

## **OECD Working Group**

RTD Director, John Miranowski, recently headed the U.S. delegation to the first meeting of a newly formed Joint Working Party (JWP) on Agriculture and the Environment established by the Organization for Economic Cooperation and Development (OECD).

At the meeting held in Paris, September 8-10, four main topics were reviewed: (a) Integration of the analysis of agricultural and environmental policies; (b) Issues in sustainable agriculture; (c) Identification of economic instruments for achieving environmental goals in agriculture, and (d) Definition and conceptual modelling for integrating environmental indicators into agricultural policy analysis. In addition, the latest results were presented from OECD's agri-environmental questionnaire.

The priorities established by the JWP were (1) the establishment of agri-environmental indicators to evaluate current and alternative agricultural policies with respect to their effects on the environment and their interaction with environmental policies; (2) further analysis of the impacts of and problems with applying economic instruments in the agricultural sector, including possible case studies from member countries; (3) evaluation of practical ways of applying the polluter-pay-principle in agriculture given experiences and problems of member countries; and (4) review status and content of OECD's work on agriculture, trade, and environment to identify policy issues and analytical needs.

The JWP elected Michael Madden of the United Kingdom as its chairman. Madden heads the UK Ministry of Agriculture's group on environment. The four vice-chairmen elected were balanced between agriculture officials -- John Miranowski (US) and Masamichi Saigo (Japan) -- and officials from environmental agencies -- Daniel Zurcher (Switzerland) and Hans Tore Heir (Norway). The next meeting of the JWP is tentatively scheduled for June 1994.

## **Eastern Europe and Former USSR Activities**

As efforts have evolved to establish market economies in former communist countries, a number of RTD staff have participated in technical assistance activities involving resource issues.

Stan Daberkow, has been participating in the ERS-Polish Institution Building Project funded under the 1990/91 SEED II Act through USAID and USDA. ERS staff are working with counterparts in several Eastern European countries to develop their capacity to (a) produce and disseminate information on commodity and input markets (situation and outlook); and (b) conduct analysis on agricultural issues facing government decision-makers (policy analysis).

Daberkow was involved in establishing an Inputs Situation and Outlook Report within the Institute of Agriculture and Food Economics, which is associated with the Polish Ministry of Agriculture. The Polish Inputs S&O Reports series was initiated in the early Spring of 1992 with subsequent reports published in October 1992 and June 1993. The team of Polish economists working on the project visited ERS in the beginning of 1992 to observe our S&O process, discuss forecasting methodology, and learn about our data collection system. Daberkow traveled to Warsaw prior to the release of each report to assist in the review and clearance process.

The reports initially focused on the internal markets for pesticides, fertilizers and farm machinery. Later reports added information on energy, agricultural services, and seeds. In each of these cases, private input markets were only beginning to be organized as the entire economy abruptly retreated from central planning in 1989. During the last four years private Polish farmers, and the State farms, have faced rapidly rising input prices, stagnant commodity prices, extremely high real interest rates, and an uncertain agricultural intervention policy. Input use fell dramatically during the 1989-1992 period but stabilized, and in some cases, increased slightly in 1993. While the reports typically emphasized the interrelationships



between input markets and agricultural commodity production, several of the Ministry of Agriculture officials involved in clearing the reports were also aware of the implications of input use, especially agri-chemicals, on environmental quality and food safety.

Gene Wunderlich participated in a companion institution building project in Bulgaria. Wunderlich visited Bulgaria in the Spring of 1992 and prepared a report on land tenure and agriculture in Bulgaria for the resident U.S. advisor to the Ministry of Agriculture. Major effort was underway in Bulgaria to process applications for ownership restitution under the Ownership and Use of Farm Land Act of April 1992.

Early focus was on cadastral work and development of a revised legal system for implementing land reform. The Central and Eastern European Law Initiative of the American Bar Association, USAID, and various West European efforts have been directed at these issues.

Wunderlich's focus was on issues involved with creating a land market, tenure arrangements, and land pricing. Bulgarian officials involved in the land reform process have visited ERS since the initial visit. The land reform issue is of sufficient importance that the Ministry of Agriculture has been renamed the Ministry of Agricultural Development, Land Use and Land Restitution.

In June, 1993, Wunderlich spent a month in Armenia under the auspices of Volunteers in Overseas Cooperative Assistance (VOCA). As in Bulgaria the initial phase of privatization had been completed under legislation dating to 1991 and early 1992. Wunderlich's report notes that, "Official statistics report a transformation of 794 of 860 state, collective, and joint agricultural enterprises into 238,000 peasant farms, 7,700 peasant collective farms, and 24 state enterprises, as of January, 1993, with some changes still in process. Of the total of 1,333,000 Ha of land in Armenian agriculture, 598,000 Ha were available for privatization. A reserve, currently 18 percent, was kept for village structures and later distribution. Pastures were not privatized. Of the 491,000 Ha of land initially intended for privatization, 410,2000 (83.5%) had been privatized by January, 1993."

At the time of privatization a 3 year moratorium was placed on sales and transfer of landownership. The approaching end of the moratorium called for increased attention to institutions to support a land market. Wunderlich's report addresses issues surrounding title registration; the cadastre; land prices; land tenure, ownership, size; statistics on land value and taxation; land taxation; and credit.

Peter DeBraal, travelled to Ukraine in July-August, also under auspices of VOCA, to provide information to the Zhitomir Farmers Association about real estate transactions, financing, and land titles in the United States. In January 1993, the first laws allowing for private ownership of real estate in Ukraine were enacted. The laws deal primarily with small farm plots and residential apartments but are a dramatic departure from the past. Debraal provided information on how real estate is bought and sold in the United States, the role of information, functions of financial institutions and mortgages, and how we track ownership records. Wunderlich is participating as an agricultural land technical advisor on a USAID sponsored project in Ukraine beginning in early November. The project involves short-term technical assistance in the formulation of concept proposals, concept papers, policy statements and legislative drafting on land privatization.

### **Spatial Econometrics Short Course**

RTD sponsored Dr. Luc Anselin for a two-day course in spatial econometrics and statistics for ERS and other researchers currently working or interested in cross-sectional work associated with geographic information systems. The course, organized by GIS Coordinator Ralph Heimlich, was held October 18 and 19 in the ERS computer training room to facilitate demonstration of the SPACESTAT econometrics software developed by Dr. Anselin.

Explicit handling of spatial dependence in econometrics with cross section and panel data sets is important because ignoring spatial dependence can produce biased and inconsistent estimates, biased inferences regarding the statistical properties of estimated coefficients, and inefficient estimates. The course covered differences between spatial and nonspatial data, spatial lags, spatial autocorrelation, spatial autoregressive and moving average processes, tests for spatial dependence, estimation of spatially lagged models, different forms of spatial regression models, model selection, and practical issues dealing with spatial econometric estimation and computation.

Dr. Anselin is a noted lecturer in spatial statistics and econometrics with a unique perspective in both economics and geographic information systems. He served most recently as the Associate Director of the David Simonett Center for Spatial Analysis at the National Center for Geographic Information and Analysis at the University of California, Santa Barbara. Dr. Anselin is currently on leave at West Virginia University's Regional Research Institute. He is the author of a specialized textbook Spatial Econometrics: Methods and Models (1988 Kluwer Academic Press), and edited a 1992 special edition of the journal Regional Science and Urban Economics on space and applied econometrics, from which material for this course was drawn.

The course, part of an ongoing series of GIS training sessions and seminars, was attended by more than 30 people, including researchers from all ERS Divisions, Visiting Scholars, National Agricultural Statistics Service and the National Center for Resource Innovations. The ERS Data Service Center's Charlie Hallahan is considering a follow-up regression seminar series for ERS researchers to treat the topics covered in this overview in greater depth.

### **Land Trust Conference**

Betsey Kuhn, Abe Tegene, and Keith Wiebe recently attended a conference on land conservation sponsored by the Land Trust Alliance. The conference brought together some 600 practitioners and professionals from across the country, and was held September 29 through October 3 in Montana.

Land trusts are local or regional non-profit organizations that purchase land or negotiate conservation restrictions in order to protect wetlands, natural areas, wildlife habitat, farmland, and other open space uses. Some 1000 land trusts in the United States have helped protect over 3,000,000 acres to date. During the conference, Kuhn, Tegene, and Wiebe attended workshops and seminars including the legal and tax dimensions of conservation easements, property rights and environmental preservation, wetland and farmland protection, and the role of public-private partnerships. The conference provided information and contacts that will be useful in the Branch's major report on property rights and land use in the United States planned for next year.

### **Eighth Grazing Lands Forum Scheduled**

The Grazing Lands Forum (GLF) is planning a one-day program on December 2, 1993, in Washington, DC, titled **An Explosion in Slow Motion: Noxious Weeds and Invasive Plants on Grazing Lands**. GLF is a coalition of twenty-nine organizations, Federal agencies, professional societies, and individuals that seeks to promote cooperation to improve stewardship on America's public and private grazing lands and associated water resources. Previous Forums have discussed topics such as water quality and grazing lands management, and multiple use values and management of grazing lands.

The program planned for the Eighth Forum includes information on the effect of weeds and the biology of their spread and control, historical perspectives on "biological pollution", an update on national strategies for improving legislation, and a panel session sharing experiences of coalitions formed to deal with noxious weeds.



ERS has been an active participant in GLF for a number of years and RTD's Ralph Heimlich serves as the current First Vice President. To register for the December Forum call program co-chairs Deen Boe (202-205-1460) or Ralph Heimlich (202-219-0431).

## PEOPLE\*

Welcome to ...

- Uwe Lohmann (RP), who is a Visiting Scholar from the University of Gottingen, Germany.
- Ian Perry (L&GR), who is a Visiting Scholar from the University of Chicago.
- John Reilly (OD), who returned from an Intergovernmental Personnel Act appointment with the Center for Energy and Environmental Policy Research at Massachusetts Institute of Technology, and is Deputy Director for Technology.

Appointment Changes ...

- Utpal Vasavada (P&ET), is the new Leader, Sustainable Production Systems.

Farewell to ...

- Nicole Ballenger (RP), who has an Intergovernmental Personnel Act appointment with the Board on Agriculture, National Research Council, National Academy of Sciences.
- Neil Hohmann (L&GR), who is attending graduate school at the University of Chicago.
- LeVale Jenkins (OD), who accepted a position with Cooperative State Research Service.
- Kenneth Robinson (OD), who accepted a position in the Washington office of the State of Texas.
- Martin Shields (E&HR), who is attending graduate school at the University of Wisconsin.

Our Summer Interns

- Pearl Buenvenida (E&HR), who returned to the University of Maryland.
- Farley Burge (L&GR), who returned to Duke University.
- Jonathan Cohodas (P&ET), who returned to Virginia Tech.
- Tracy Cruz (RP), who returned to St. Johns University.
- Leslie Dews (P&ET), who returned to Howard University.
- Rhonda Franklin (E&HR), who returned to Clark-Atlanta University.

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\*RTD Branch and other units are abbreviated as follows: Office of the Director (OD), Environmental and Health Risk (E&HR), Land and Global Resources Branch (L&GR), Resource Policy Branch (RP), Water Branch (W), and Productivity and Emerging Technologies Branch (P&ET)

- Jacquelyn Griffin (E&HR), who returned to Pennsylvania State University.
- Trudi Hughes (P&ET), who returned to California Polytechnic.
- Elisha Nuzum (L&GR), who returned to Ohio and plans to attend graduate school.
- Anthony Shen (P&ET), who returned to Stanford University.
- Brad Umidi (RP), who graduated from James Madison University.
- Nytasha Walters (OD), who returned to the University of Washington.

## PUBLICATIONS

(October 1992 - September 1993)

### ERS/USDA PUBLICATIONS

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- Lynch, Sarah and Fred Kuchler. Chemical Inputs and Food Safety. Agriculture Information Bulletin No. 664-16. April 1993. 2 pp.
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- Malik, Arun S. and Robbin A. Shoemaker. Optimal Cost-Sharing Programs to Reduce Agricultural Pollution. Technical Bulletin No. 1820. June 1993. 18 pp.
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